

# LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Oct. 27-Nov. 3, 2008.

## **CBS radio airs story on LLNL's pathogen detector**



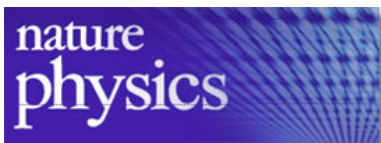
Imagine a rapid tuberculosis detection technique that could save millions in healthcare costs.

Lawrence Livermore has created one that started out as a pathogen detector originally designed for homeland security. Now the device is being probed for potential medical applications including tuberculosis detection.

CBS radio recently featured an interview with the Lab's Kristl Adams, who describes how the Single-Particle Aerosol Mass Spectrometry, or SPAMS, can be used to rapidly detect tuberculosis.

To hear the story, go to <http://www.ucop.edu/sciencetoday/article/18841>

## **Lab research in probing warm dense matter in Nature Physics**



LLNL researchers and colleagues in the United States and Europe have developed a new technique for understanding warm dense matter (WDM), a complex and little explored state of matter that occurs during inertial confinement

fusion experiments such as those planned for the National Ignition Facility, a laser experiment that aims to achieve fusion in the laboratory.

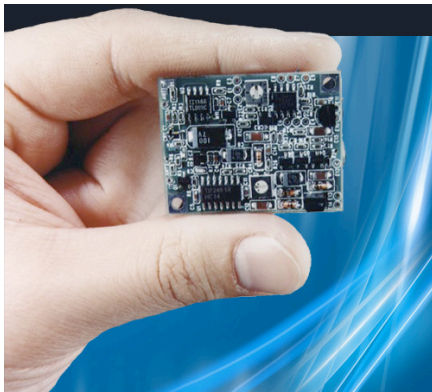
WDM is characterized by temperatures usually associated with plasmas but at densities similar to solids. In addition to shedding light on the implosion phase of controlled thermonuclear fusion, the study of WDM also represents laboratory analogues of astrophysical environments found in the core of planets and the crusts of old stars.

Because it has properties common to both solids and plasmas, WDM presents great challenges to experimental characterization and theoretical modeling.

To read more about the research, go to

<http://www.nature.com/nphys/journal/vaop/ncurrent/full/nphys1103.html>

Federal Technology Watch highlights LLNL royalty income



Micropower impulse radar technology

Federal Technology Watch features a story in its latest edition about Lawrence Livermore's royalty income of \$9.4 million from technology licenses in fiscal year 2008.

The income is the Lab's best ever annual result and one of the highest royalty incomes achieved by a Department of Energy (DOE) national lab in a single fiscal year.

LLNL's top four technologies for royalty income are:

- Whole chromosome paints, a cancer and disease diagnostic, advance license to Abbott Laboratories of Abbott Park, Ill.;

- Laser peening technology for strengthening jet engine fan blades and discs as well as other metal components, licensed to Metal Improvement Co. Inc., of Paramus, N.J.;
- Rapid polymerase chain reaction microchip technology that heats and cools DNA, licensed to Cepheid of Sunnyvale, Calif.;
- Micropower impulse radar technology that's small, inexpensive and accurate and licensed to 12 companies for fluid-level sensing and residential, commercial, industrial automation as well as transportation, medical and security applications.



Charlie Westbrook

LLNL's combustion guru Charlie Westbrook elected SAE fellow  
For more than 30 years, Charlie Westbrook has been a pioneer in the combustion field. While he officially retired from the Laboratory three years ago (after 41 years of service), he can still be found at the Lab a few days a week working chemical kinetic modeling codes, the backbone of combustion.

He realized early on in his career that the same codes he was working on to study the dynamics of weapons also could be applied to combustion chemistry. By grasping this, Westbrook was on his way to becoming the combustion guru at the Lab, in the auto industry and worldwide.

Westbrook has won many awards for his research including most recently being named a fellow of the Society of Automotive Engineers (SAE). He also earned the Combustion Institute's 2008 Bernard Lewis Gold Medal, the American Chemical Society's Thomas Midgley Award, SAE's Horning Memorial Award, SAE's Arch Colwell Award of Merit in 2000 and 2003. In addition, in August, Westbrook began his four-year term as president of the Combustion Institute.

And they're off



Tie-dyed shirts and disco music set the tone of the 1970s theme at last week's Run for Home, which launched the Lab's 34th Helping Others More Effectively (HOME) Campaign.

The HOME Campaign is the Laboratory's annual charitable drive in which employees donate to those in need in the community. The drive runs through Dec. 5. Employees already have contributed more than \$160,000.

The Lawrence Livermore National Security, LLC Board of Governors (the manager of the Laboratory) has agreed to match employee contributions up to a total of \$1 million. If the campaign exceeds \$1 million in employee donations, the matching funds will be pro-rated.

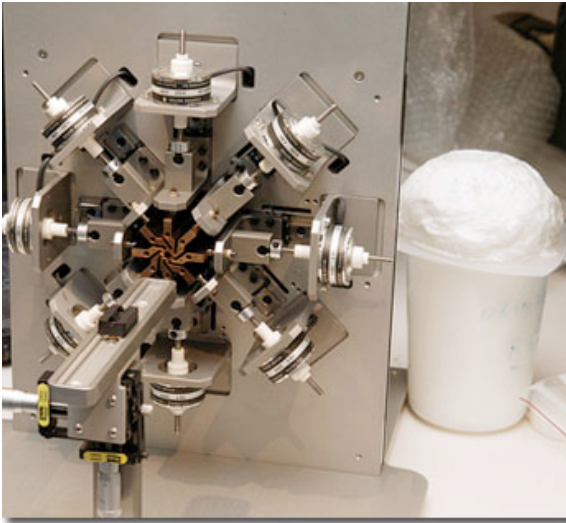
Photo of the week

**Latest edition of weekly *Newsline* available**



*Newsline* provides the latest lab research and operations news. See the latest issue at [https://newsline.llnl.gov/\\_rev02/index.php](https://newsline.llnl.gov/_rev02/index.php)

Photo of the week



Just crimp it -- An eight-blade cylindrical crimping machine with heated blades at the Laboratory compresses shape-memory-polymer foam into a secondary shape. Next to the crimping machine is a foam "soufflé" from which the plugs are first cut. A Livermore team has developed an alternative treatment that isolates an aneurysm from the rest of the vascular system with one implanted device -- a "plug" made from shape-memory-polymer (SMP) foam.

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LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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